

FORM PTO-1390  
(REV. 1-98)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

1998P05915WOUS

U.S. APPLICATION NO. (If known, see 37 CFR 1.5

09/786421

INTERNATIONAL APPLICATION NO.

PCT/DE99/03922

INTERNATIONAL FILING DATE

December 8, 1999 ✓

PRIORITY DATE CLAIMED

December 11, 1998 ✓

TITLE OF INVENTION

CONTROLLING AND MARKETING METHOD FOR UTILIZATION OF THE INTERNET/INTRANET

APPLICANT(S) FOR DO/EO/US

Kurt KLEMMANN, Bernhard NAUER and Maximilian RIEGEL ✓

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☐ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau. (see PCT/IB/308) .
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.  
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

Application Data Sheet.

Form PCT/IB/308.

Petition to Revive Unintentional Abandonment.

U.S. APPLICATION NO. (if known, see 37 CFR 1.51)

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INTERNATIONAL APPLICATION NO.  
PCT/DE99/03922ATTORNEY'S DOCKET NUMBER  
1998P05915WOUS17. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):**Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO  
and International Search Report not prepared by the EPO or JPO ..... \$1000.International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ..... 860.International preliminary examination fee (37 CFR 1.482) not paid to USPTO  
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... 710.International preliminary examination fee (37 CFR 1.482) paid to USPTO  
but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... 690.International preliminary examination fee (37 CFR 1.482) paid to USPTO  
and all claims satisfied provisions of PCT Article 33(1)-(4) ..... 100.**ENTER APPROPRIATE BASIC FEE AMOUNT =****CALCULATIONS PTO USE ONLY**

\$ 860

Surcharge of \$130.00 for furnishing the oath or declaration later than ☒ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$ 130

**CLAIMS****NUMBER FILED****NUMBER EXTRA****RATE**

\$

Total claims

7 - 20 =

0

x \$ 18.

\$ 0

Independent claims

1 - 3 =

0

x 80.

\$ 0

**ADDITIONAL DEPENDENT CLAIM(S) (if applicable)**

+ 270.

\$

**TOTAL OF ABOVE CALCULATIONS =**

\$ 990

Reduction of 1/2 for small entity

\$

**SUBTOTAL =**

\$ 990

Surcharge fee of \$130.00 for furnishing the English translation later than ☒ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

\$ 130

**TOTAL NATIONAL FEE =**

\$ 1120

or recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$

40

**TOTAL FEES ENCLOSED =**

\$ 1160

Amount to be  
refunded:

\$

charged:

\$

a. ☒ A check in the amount of \$ 1,160 to cover the above fees is enclosed.b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required by  
37 CFR 1.16 and 1.17, or credit any overpayment to Deposit Account No. 25-0120. A duplicate  
copy of this sheet is enclosed.NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR  
1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

March 6, 2001

SEND ALL CORRESPONDENCE TO:

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Benoit Castel

NAME

35,041

REGISTRATION NUMBER

09/786421

JC02 Rec'd PCT/PTO 06 MAR 2001

PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Kurt KLEMMANN et al.

Serial No. (unknown)

Filed herewith

CONTROLLING AND MARKETING  
METHOD FOR UTILIZATION OF  
THE INTERNET/INTRANET

PRELIMINARY AMENDMENT

Commissioner of Patents

Washington, D.C. 20231

Sir:

Prior to calculation of the filing fee, please amend  
the above-identified application as follows:

IN THE CLAIMS:

Cancel claims 1-8.

Add the following new claims:

--9. (new) A method for capturing the utilization  
behavior of an Internet/Intranet subscriber, so that

- the subscriber data is logged over a specific time period
- the recorded subscriber data is analyzed using at least one  
of the following methods:

- the rule-based method
- the neural network - supervised learning
- density-based profile modeling
- the causal network

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in such a way that a subscriber is assigned to a category of utilization behavior in accordance with their subscriber behavior.

--10. (new) The method as claimed in claim 9, characterized in that the subscriber data is derived from at least one of the following data types: RADIUS data, SNMP data, TCP dump protocol data.

--11. (new) The method as claimed in claim 9, characterized in that the subscriber data is subjected to rule-based preprocessing before analysis.

--12. (new) The method as claimed in claim 11, characterized in that the subscriber data subjected to preprocessing is held in interim storage before analysis.

--13. (new) The method as claimed in claim 11, characterized in that in accordance with the analysis result of at least one of the methods, the selection rules are automatically adjusted for the preprocessing of subscriber data.

--14. (new) The method as claimed in claim 9, characterized in that the results, and particularly the current results, of analyses from the individual methods are combined to provide a final result.

--15. (new) The method as claimed in claim 9, characterized in that the results of analyses from the individual methods used in a current monitoring period and a

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past monitoring period are combined to provide a final  
result.--

Respectfully submitted,

YOUNG & THOMPSON

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March 6, 2001

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## Description

Controlling and marketing method for utilization of the Internet/Intranet

The subject of the patent application (subsequently referred to as the invention) concerns a method for capturing the utilization behavior of an Internet/Intranet subscriber, including the features of claim 1.

Unauthorized utilization of Internet access (e.g. by private individuals using the flat-rate tariffs of an Internet Service Provider or by company employees) can reach levels that pose a threat to the business viability of an Internet Service Provider or a company. In technical terms, it is currently very difficult to identify such utilization behavior early enough to respond at the appropriate time.

Private customers, business customers and company employees use the Internet/Intranet in different ways, e.g. for occasional surfing, for data throughput (variable quantities), for playing games, etc. Until now, it has been very difficult for the Internet Service Provider to implement selective marketing activities for different user groups, to identify market trends, or even to determine the potential for cost savings within a company (e.g. in the case of corporate networks), because the technical tools available cannot satisfactorily associate individual Internet/Intranet users with different behavior categories with accuracy.

Various tools currently exist to detect fraud in the context of telecommunications. These tools are based on a variety of techniques, such as the rule-based approach or neural networks, etc. These techniques are used to evaluate CDR (Call Detail Records) or signaling data from the CCS7 signaling system.

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A tool called "HP OpenView Smart Internet Suite; Smart Internet Usage" has been announced. This tool collects, correlates and compresses utilization-specific Internet data, and offers a retrieval function for this data (data mining). Details of the technical implementation and exact scope of the retrieval function are not known.

The subject matter of the application addresses the problem of providing a method, which increases the significance of information output and reduces error rates, in comparison with conventional methods.

The problem is resolved using a method with the features of claim 1.

As well as the early collection of suspicious incidents (keyword: fraud) regarding non-specific utilization (e.g. unauthorized utilization of the Internet/Intranet), this tool produces results that can be used for marketing purposes, to identify market trends, to ensure rapid response to requirements to expand the Internet/Intranet network, or to reduce the cost of Internet/Intranet utilization.

The invention gives Internet Service Providers and companies extremely good information about the type of Internet/Intranet utilization (and particularly unauthorized utilization), market trends (and particularly sudden behavior changes in relation to Internet/Intranet utilization), marketing, and the necessity for network expansion etc. In particular, this invention overcomes the disadvantages of the data mining tools that are currently on the market. By configuring the subject matter of the application in a particular way, the results of individual methods can be

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compressed (combined and associated) to provide significant information with extremely low error rates.

Advantageous developments of the subject matter of the application are specified in the subclaims.

In order to allow an adequate understanding of the subject matter of the application, the following implementation example provides an explanation on the basis of figures, in which

Fig. 1 shows a known sequence;

Fig. 2 shows a schematic block diagram of elements and their interaction in the subject matter of the application;

Fig. 3 shows an application example for modeling a behavior category in the causal network.

The same designations in the figures refer to the same elements.

As shown in Figure 1, the known tool appears to work as follows: In Step 1, the Internet data Idat is correlated and compressed in accordance with fixed rules as part of preprocessing (PP), to produce Internet Data Records (IDR); in Step 2, the Internet Data Records can be output together with rules entered by the operator (e.g. in the form of select statements) as the OUT result as part of the analysis procedure RETR (retrieval, data mining). A number of disadvantages are apparent as follows: A change in the IDRs requires a change in the preprocessor; the rules can relate only to the IDRs (and particularly the IDR structure); the IDRs are static, which means that information is lost; purely rule-based systems are not capable of learning; purely rule-based systems do not recognize "exceptions to the rule" (resulting in a large volume of incorrect information); and purely rule-based systems do not recognize limit ranges.

Using the method as per the invention shown in Figure 2, the Internet data Idat can undergo rule-based preprocessing



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(RBPP), where the Internet data is correlated and compressed. The Internet data can be stored as an interim result in interim memory (INTM), in preprocessed format if applicable. The Internet data, in preprocessed format if applicable, and after interim storage if applicable, is then transferred to a method approach (MA) unit, which has a rule-based approach (RBA), a neural network with supervised training (NNUE), density-based profile modeling (DBPM), and a causal neural network (KNN), subsequently referred to as a causal network. As shown by two two-directional arrows, the method approach (MA) unit works with a rule base (RB), which contains rules, an MO/TR database, which contains modeling and training data, and a HIST database, which contains the results of analyses from current and past monitoring periods. The interim results output by the method approach (MA) unit or stored in the HIST database can undergo analysis in the combination (COMB) unit and then be output as result OUT.

The method as per the invention includes a combination of four different method approaches, namely the rule-based approach and three neurocomputing method approaches (neural network with supervised training, density-based network and causal network). Both the formulation of rules and modeling with neurocomputing methods are based on data that is stored by the Internet Service Provider or company: RADIUS Accounting data (generally stored), TCP dump protocol data (stored if required, variable volume), SNMP (Simple Network Management Protocol) data (stored if necessary), etc. The resulting model represents a controlling and marketing tool.

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The method as per the invention is intended for use with Internet/Intranet data that is stored by the Internet Service Provider or a company. Such data includes RADIUS Accounting data, TCP dump data, and SNMP data. The method can also process all other types of Internet/Intranet data.

RADIUS Accounting data is derived from data as described in IETF Specification RFC 2139. An actual implementation example is described in Livingston Enterprises Inc., Radius dictionary, V1.6, 1997.

TCP dump data is derived from data as described in the UNIX man pages 'tcpdump - dump traffic on a network'.

SNMP data is derived from data as described in the various IETF RFCs. An actual implementation example is described in Livingston Enterprises Inc., Configuring SNMP, Manual Portmaster 3.

An optional rule-based preprocessor can be installed to accelerate the processing of data. The task of the preprocessor is to correlate and compress the Internet/Intranet data, in order to provide data records with the attribute values required by the actual method.

In principle, a preprocessor can be used in the same way as is intended in the known solution proposal. However, this is conditional upon the IDRs containing a superset of the attribute values required by the method.

A rule-based preprocessor is used in a preferred embodiment of the invention. Using this configuration, the rules control the correlation and compression of Internet/Intranet data.

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If a new characteristic attribute is added or an existing characteristic attribute is omitted in the actual method, then the selection rules of the preprocessor can easily be adapted (automatically). Automatic adaptation of the selection rules can be controlled by means of notifications (unsolicited messages) to the preprocessor, as shown by ADAP (adaptation) in Figure 2.

The method described below can be based on any of the following:

- on the Internet/Intranet data directly
- on results from any preprocessor (e.g. HP (Hewlett Packard) IPR)
- on results from a specific rule-based preprocessor (shown by INTM in Figure 2).

The actual method is divided into four methods. Each method uses a different method approach. The four different method approaches are as follows:

- the rule-based method
- the neural network - supervised learning
- density-based profile modeling
- the causal network.

With the rule-based method, typical, user-specific behavior categories can be modeled with the aid of rules. Behavior is then classified by a behavior category. For example, behavior categories such as "Student private use", "Employee private use", "Self-employed private use", "Small business establishment use",—"Large business establishment use", "Games player", "Internet/Intranet addict", "User with high mail volumes", etc. can be expressed in the form of rules using their own characteristic properties. The rules are applied to all Internet/Intranet data or part of this data (e.g. the result of preprocessing). As a result of the method, each user can be assigned to no

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behavior categories, one behavior category, or several behavior categories, at the end of a monitoring period the monitoring period can also vary depending on the behavior category and the reason for monitoring. For example, if the purpose is to detect fraud (as part of controlling), then the monitoring period would be quite short (e.g.  $t=1$  day). However, a monitoring period of several weeks would be used to obtain marketing information (e.g.  $t=4$  weeks). If the results of each monitoring period  $t(i)$  are stored in the HIST database on a user-specific basis, then it is very easy to identify changes in user behavior by comparing the individual results for  $t(i)$ . For example, the utilization of a given user may have matched to the behavior category "Student private use" at the beginning, but now it would be more appropriate to assign it to the behavior category "Small business establishment use".

The objective is to formulate rules for each behavior category. These rules are defined by means of logical expressions, where the fields (attributes) of the different data records are used as variables. For example:

"Private contract employee" utilization ::= the following applies to all data records in the monitoring period: utilization time Monday to Friday between 17:00 hours and 24:00 hours and utilization time on weekends from 00:00 hours to 24:00 hours and data throughput rate < 2 megabytes per utilization and maximum utilization time = 2 hours.

"Private contract self-employed" utilization ::= there is one data record in the monitoring period, for which the following applies: not "Private contract employee" utilization and the following applies to all data records in the monitoring period: data throughput rate < 10 megabytes per day and maximum utilization time = 8 hours.

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In principle, rules can refer to one or more data records (including different files).

During the usage phase of the rule-based method, all the selected rules are tested for the specified data at the time  $t$ . The results are initially recorded on a user-specific basis in the HIST database.

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Strengths of the rule-based method:

- Classification of user behavior in the form of behavior categories
- It is easy to derive trends, marketing information, contract infringements, etc.

With the supervised approach, a neural network is trained with a set of examples. The requirement for training is that the corresponding target value must be specified for each example, i.e. it must be known at the time of training whether e.g. a defined use existed or not for the example concerned (examples of defined uses are "Contract infringement private contract employee", "Primary use surfing", "Primary use games player", etc.). It is also necessary to specify the target values to be examined and the characteristic attributes for the example. The characteristic attributes determine the behavior of a user. The behavior is therefore dependent on specific attribute values (the data itself).

Examples of characteristic attributes are as follows:

- average utilization time per day over a monitoring period (e.g. four weeks) for the user
  - distribution of utilization time for the user
  - maximum utilization time
  - minimum utilization time
  - average throughput rate per day over a monitoring period (e.g. four weeks) for the user
  - distribution of throughput rate for the user
  - maximum rate
  - minimum rate
  - average utilization duration of special Internet/Intranet services over a monitoring period (e.g. four weeks) for the user
  - distribution of utilization duration for the user
  - maximum utilization duration
  - minimum utilization duration
- etc.

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During the training phase (preliminary stages) of the neural network, the objective is to create a model that can decide, based on the specified example, whether or not the Internet/Intranet access utilization relates to one or more of the defined target values, for a given user. The model is created by means of supervised training, the principles of which are described in detail in 'Learning internal representation by error backpropagation' by D.E. Rumelhart, G.E. Hinton and R.J. Williams, contained in 'Parallel Distributed Processing', Pages 318-362, Cambridge, MA, MIT Press (1986).

The following steps are performed during the training phase: A behavior sample is allocated to each user in the form of attributes. This behavior sample describes a specific profile over an extended period. In this context, the attributes characterize utilization relating to a defined target value. The period that is used as a basis for the behavior sample should not be shorter than four weeks, and should precede the time when the method is used for the purpose specified above.

Based on training data, the neural network is trained for utilization relating to the defined target values. The training data indicates whether or not the utilization can be assigned to a specific target value.

During the usage phase of the neural network, which begins when the training phase is complete, the following steps are performed continuously:

Using the examples as a basis, the neural network decides whether or not the utilization can be assigned to a specific target value. This decision is recorded on a user-specific basis in the HIST database, as a result of the monitoring period.

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If necessary, the neural network can be trained with new target values relating to its utilization (e.g. as yet unknown cases of contract infringement).

These methods are applicable if the user is included in the data.

Strengths of this method:

- Simple assignment of exceptions;
- Exceptions included in the result;
- Learning capability.

Density-based profile modeling is concerned with the probabilistic modeling of the behavior for each user (probabilistic profile modeling), i.e. a model is generated for each user, based on the examples associated with that user. These examples comprise characteristic attributes and specific attribute values, which describe the use of the Internet/Intranet relating to one or more target values. Examples of characteristic attributes are given in the previous section.

The following steps are performed during the training phase of density-based profile modeling: Each user is assigned a set of examples, which describes the behavior of the user over an extended period. The period that is used as a basis for the behavior sample should not be shorter than four weeks, and should precede the time when the method is used for control and marketing purposes. A probabilistic profile is generated for each user. This is produced by means of density estimates using the EM algorithm. The exact description is given in 'Neural Networks in Pattern Recognition' by Chris Bishop, Oxford Press (1996). Once the training phase is complete, the usage phase of density-based profile modeling can begin, during which the following steps are performed continuously:

The data for e.g. one day is analyzed with regard to



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the data contents specified for probabilistic profile modeling (a new example is produced). The density-based profile model outputs a value that represents a probability for the Internet/Intranet utilization of the observed entity with regard to the defined target values. This value is recorded. If this value differs from the previous values beyond a specified threshold value, then a recommendation is given that the result should be indicated in each case. Using this method, it is very easy to detect sudden changes in Internet/Intranet utilization. The profile model is retrospectively adapted using the current example. This method can be used if the user is included in the data. Strengths of this method: Detection of sudden changes in user behavior; learning capability.

The causal network method is based on the modeling of typical behavior scenarios in the form of causal dependencies and probabilities of specific data contents as in the example shown in Figure 3: "Private use employee". A Private use employee (PA) is assigned a specific utilization time (UC for UseClock), a specific utilization duration (UT for UseTime), and a specific throughput rate (RATE). The days of the week affect the level of utilization time, utilization duration and throughput rate, depending on whether it is a weekday (WD) or a weekend (WE). The causal dependencies are based on the analysis of known cases. They do not have to be assigned to specific users. The following steps are performed during the modeling phase of the causal network: the causal dependencies with regard to data contents are formulated for all data. Appropriate probabilities are assigned at those places where causal dependencies exist. The domain knowledge of technical experts is required during the modeling phase. The principle of the causal network is described in 'An Introduction to Bayesian Networks' by Finn V. Jensen, UCL Press (1996). The following steps are performed

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continuously during the usage phase of the causal network: The data records of the data to be examined are continuously examined for the causal dependencies that have been formulated. For each user or event, the system decides the probability of a specific use occurring with regard to the defined scenario. This decision is recorded in the HIST database as a result of the monitoring period. If the user is included in the data, then the results are recorded on a user-specific basis. The probabilities behind the causal dependencies can be retrospectively adapted. The causal dependencies of new, previously unknown categories are added to the existing causal dependencies if required. This method can also be applied if the user is not included in the data. However, it is not possible to assign a category to a specific user in this case.

Strengths of the causal network method: Assignment of limit ranges in behavior categories; recognition of limit ranges in behavior categories; learning capability. In principle, it is possible to output the individual results of the individual methods. In a further form of the invention, the individual results of the individual methods are compressed into an overall result. This compression includes the individual results of the various methods. The individual results can be taken from the current monitoring period and from previous monitoring periods. Each of the described methods has specific strengths. This can be useful for compression, as described in the following example: The rule-based method may unequivocally assign User x to the "Private use self-employed" behavior category, if he used the Internet for more than 2 hours on a single day (based on the example rule described above). However, the causal network may consider User x falls into the "Private use employee" behavior scenario, since he observed the utilization time of less than 2 hours in more than 90% of data records, for example. These findings could then

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be shown in the overall result, in such a way that utilization of the Internet/Intranet by User x is treated as "Private use employee" with a few minor exceptions. Another example of using compression is to identify trends by analyzing the results of different monitoring periods.

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Patent claims

1. A method for capturing the utilization behavior of an Internet/Intranet subscriber, so that
- the subscriber data is logged over a specific time period
  - the recorded subscriber data is analyzed using at least one of the following methods:

- the rule-based method
- the neural network - supervised learning
- density-based profile modeling
- the causal network

in such a way that a subscriber is assigned to a category of utilization behavior in accordance with their subscriber behavior.

2. The method as claimed in claim 1, characterized in that the subscriber data is derived from at least one of the following data types: RADIUS data, SNMP data, TCP dump protocol data.

3. The method as claimed in one of the above claims, characterized in that the subscriber data is subjected to rule-based preprocessing before analysis.

4. The method as claimed in claim 3, characterized in that the subscriber data subjected to preprocessing is held in interim storage before analysis.

5. The method as claimed in one of claims 3 or 4, characterized in that in accordance with the analysis result of at least one of the methods, the selection rules are automatically adjusted for the preprocessing of subscriber data.

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7. The method as claimed in one of the above claims,

characterized in that

the results, and particularly the current results, of analyses from the individual methods are combined to provide a final result.

8. The method as claimed in one of the above claims,

characterized in that

the results of analyses from the individual methods used in a current monitoring period and a past monitoring period are combined to provide a final result.

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## Abstract

Controlling and marketing method for utilization of the Internet/Intranet

The data of an Internet/Intranet subscriber is processed by different methods, such as the rule-based approach, a neural network with supervised training, density-based profile modeling, and a causal network. The results, which can be combined if applicable, will increase the significance of information about utilization behavior while reducing error rates. This will allow the early detection of irregularities in utilization behavior, and provide information about the necessity of network expansion, as well as significant information relating to marketing and costs.

Fig. 2

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FIG 1

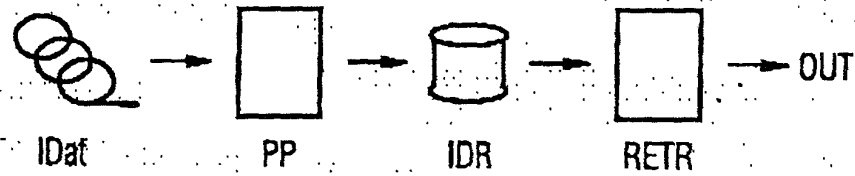
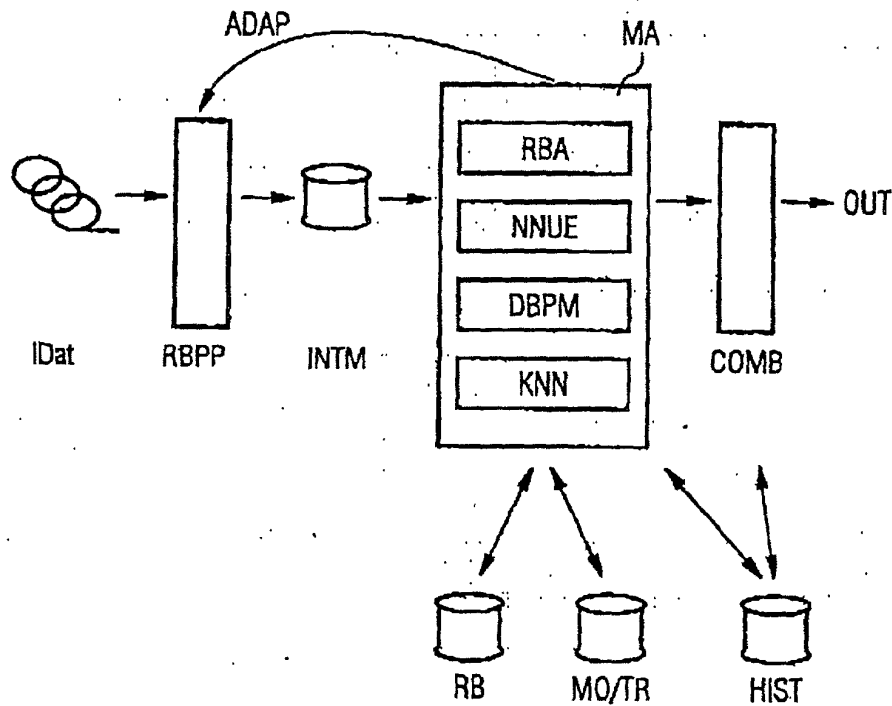


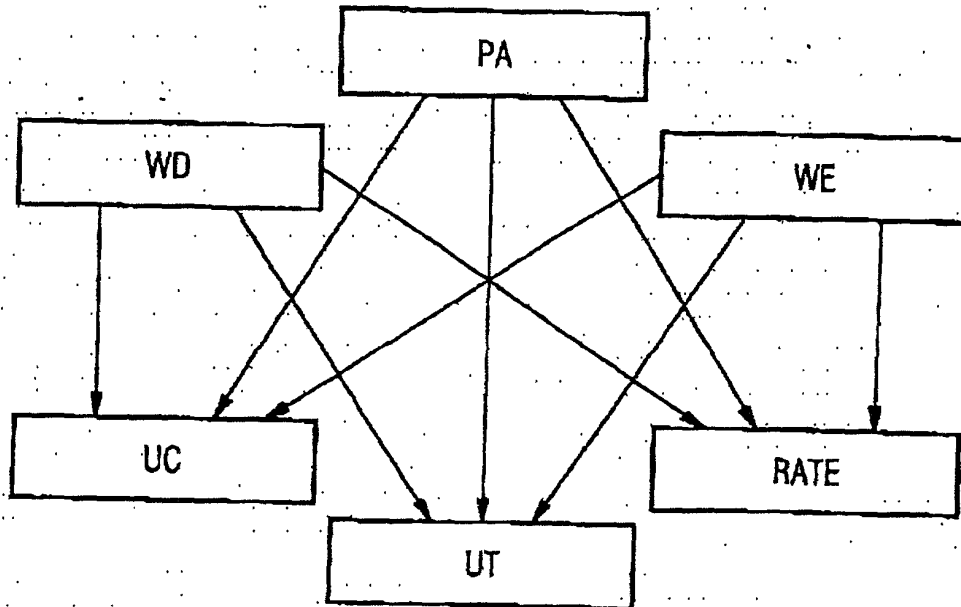
FIG 2



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FIG 3





# Declaration and Power of Attorney For Patent Application

## Erklärung Für Patentanmeldungen Mit Vollmacht

### German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Controlling- und Marketingverfahren für die Nutzung des Internet/Intranet

deren Beschreibung

(zutreffendes ankreuzen)

☐ hier beigefügt ist.

☒ am 08.12.1999 als

PCT internationale Anmeldung:

PCT Anmeldungsnummer PCT/DE99/03922

eingereicht wurde und am

abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obige ☐ Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

the specification of which

(check one)

☐ is attached hereto.

☐ was filed on \_\_\_\_\_ as

PCT international application

PCT Application No.

and was amended on

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

# German Language Declaration

Prior foreign applications  
Priorität beansprucht

Priority Claimed

19857336.7 Germany  
(Number) (Country)  
(Nummer) (Land)

11. Dezember 1998 ✓  
(Day Month Year Filed)  
(Tag Monat Jahr eingereicht)

☒ ☐  
Yes No  
Ja Nein

\_\_\_\_\_  
(Number) (Country)  
(Nummer) (Land)

\_\_\_\_\_  
(Day Month Year Filed)  
(Tag Monat Jahr eingereicht)

☐ ☐  
Yes No  
Ja Nein

\_\_\_\_\_  
(Number) (Country)  
(Nummer) (Land)

\_\_\_\_\_  
(Day Month Year Filed)  
(Tag Monat Jahr eingereicht)

☐ ☐  
Yes No  
Ja Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

\_\_\_\_\_  
(Application Serial No.)  
(Anmeldeseriennummer)

\_\_\_\_\_  
(Filing Date)  
(Anmeldedatum)

\_\_\_\_\_  
(Status)  
(patentiert, anhängig,  
aufgegeben)

\_\_\_\_\_  
(Status)  
(patented, pending,  
abandoned)

\_\_\_\_\_  
(Application Serial No.)  
(Anmeldeseriennummer)

\_\_\_\_\_  
(Filing Date)  
(Anmeldedatum)

\_\_\_\_\_  
(Status)  
(patentiert, anhängig,  
aufgeben)

\_\_\_\_\_  
(Status)  
(patented, pending,  
abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden koennen, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

# German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: (Name und Registrationsnummer anführen)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

And I hereby appoint

Messrs. ROBERT J. PATCH (Reg. No. 17355); ANDREW J. PATCH (Reg. No. 32925); ROBERT F. HARGEST III (Reg. No. 25590); BENOIT CASTEL (Reg. No. 35041); ERIC JENSEN (Reg. No. 37855); and ROLAND E. LONG, JR. (Reg. No. 41949)

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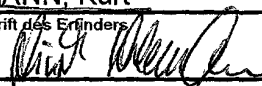
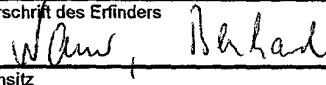
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(Supply similar information and signature for third and subsequent joint inventors).

3-00

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Staatsangehörigkeit		Citizenship	
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Unterschrift des Erfinders	Datum	Inventor's signature	Date
Wohnsitz		Residence	
Staatsangehörigkeit		Citizenship	
Postanschrift		Post Office Address	

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).